

Reply to Office Action of February 6, 2007

REMARKS/ARGUMENTS

Claims 1-13 and 15-31 are pending in this application. By this Amendment, claims 1-5, 7-10 and 16-25 are amended, and claims 27-31 are added. Support for the claims can be found throughout the specification, including the original claims and the drawings. Withdrawal of the rejections in view of the above amendments and the following remarks is respectfully requested.

I. Rejection Under 35 U.S.C. §112

The Office Action rejects claims 1-13, 15-21 and 24-26 under 35 U.S.C. §112, second paragraph, as allegedly indefinite. It is respectfully submitted that the amendments to claims 1, 7, 8, 17 and 24 are responsive to the Examiner's comments, and that claims 1-13, 15-21 and 24-26 meet the requirements of 35 U.S.C. §112, second paragraph.

Additionally, in response to the Examiner's comments regarding the correcting means, it is noted that an example of the correcting means recited in independent claim 1 is shown in Figure 3 of the present application. As shown in Figure 3, the correcting means 140 may include a fastener 144 that extends through a plate 141 and a spring 142, and through the main frame 110. A first tray T1 may be positioned beneath the main frame 110, with one end positioned on second fixing member 131 of the second fixing unit 130. The opposite end of the first tray T1 is then positioned on the first fixing member 123 of the first fixing unit 120, and the first fixing unit 120 is adjusted laterally to fix a lateral position of the first tray T1 beneath the main frame 110.

The correcting means 140 may then be engaged so that the fastener 144, plate 141, spring 142 and spacer 143 together push against the first tray T1. The pressure applied to the first tray T1 by the correcting means 140 maintains a stable position of the edges of the first tray T1 against the first and second fixing members 123 and 131, thus maintaining a stable vertical position of the first tray T1 relative to the main frame 110. It is respectfully submitted that the correcting means recited, for example, in independent claim 1, as well as dependent claims 17 and 24, would be well understood by one of ordinary skill in the art, especially when taken in light of the accompanying description thereof in the specification.

For all of the above reasons, it is respectfully submitted that claims 1-13, 15-21 and 24-26 meet the requirements of 35 U.S.C. §112, second paragraph, and thus the rejection should be withdrawn.

II. Rejections Under 35 U.S.C. §102(b)

The Office Action rejects claims 1, 2, 7, 9, 10 and 20-24 under 35 U.S.C. §102(b) over U.S. Patent No. 6,406,246 to Itoh et al. (hereinafter “Itoh”). The rejection is respectfully traversed.

Independent claim 1 is directed to a tray transferring apparatus that includes a fixing means provided on a main frame, wherein the fixing means couples a first tray to the main frame. Claim 1 further recites a correcting means provided on the main frame, wherein the correcting means adjusts a position of the first tray relative to the mainframe. The apparatus also includes a gripping means provided on the main frame, wherein the gripping means grips a

second tray, and at least one sensor provided on the main frame, wherein the at least one sensor senses at least one of an operational position of the gripping means and the presence of a second tray.

Independent claim 22 is also directed to a tray transferring apparatus. Independent claim 22 recites a fixing unit installed on a main frame and configured to hold a first tray immediately adjacent the main frame. Independent claim 22 also recites a gripper unit installed on the main frame and configured to hold a second tray bearing a plurality of electronic components in holding depressions, wherein the gripper unit is configured to hold the second tray adjacent a side of the first tray opposite the main frame.

Itoh neither discloses nor suggests the features recited in independent claims 1 and 22, or the respective claimed combinations of features.

Itoh discloses a device handler that is substantially identical to the related art tray handler discussed in the present application (see, in particular, page 3, line 1 though page 5, line 3, and Figure 1 of the present application). Itoh's handler includes a tray movement arm 205 that holds and moves customer service trays KSTs, which presumably hold electronic devices, in the handler. The movement arm 205 includes a base plate 232 that is moved in the X-direction by a ball screw 231. Two tray holding plates 234 and 235 extend outward from a main surface of the base plate 232. The upper and lower plates 234, 235 move in the Z-direction along a linear guide 233 under the power of first and second cylinders 236 and 237.

A first customer service tray KST is positioned on a top surface of the upper plate 234 and held in place by guide pins 238. A second customer service tray KST is positioned adjacent to a bottom surface of the lower plate 235, and is held in place by a hook mechanism 239. The hook mechanism 239 includes hooks 240 at the corners of the lower plate 235 that are opened and closed by a link mechanism 242 and cylinder 241.

The Office Action draws a comparison between lower tray 235 disclosed by Itoh and the recited main frame, between the hook mechanism 239 and link 242 disclosed by Itoh and the recited fixing means, between the guiding pins 238 disclosed by Itoh and the recited correcting means, and the hook 240 disclosed by Itoh and the recited gripping means. The hook mechanism 239, which includes the hook 240 and link 242, is coupled only to the lower plate 235, and holds only the lower customer service tray KST in place at the bottom surface of the lower plate 235. Thus, if such a comparison is to be drawn, then the hook mechanism 239/hook 240/link 242 (comparable to the recited fixing means) are provided on the lower plate 235 (comparable to the recited main frame) to couple the lower customer service tray KST (comparable to the recited first tray) to the lower plate 235. However, the guide pins 238 (compared in the Office Action to the recited correcting means) are provided on the upper plate 234 to guide and hold an upper customer service tray KST (comparable to the recited second tray) on the upper plate 234, and not the lower plate 235.

The fixing means, correcting means, gripping means and at least one sensor recited in independent claim 1 are each provided on the main frame. Thus, if the lower plate 235 is to be

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compared to the recited main frame, and the guide pins 238 are to be compared to the recited correcting means, as suggested in the Office Action, then Itoh neither discloses nor suggests a correcting means provided on the lower plate 235, as recited in independent claim 1.

Additionally, the upper and lower plates 234, 235 are sequentially positioned between the upper and lower customer service trays KSTs. Thus, Itoh neither discloses nor suggests a gripper unit that holds a second tray adjacent a side of a first tray that is opposite a main frame, as recited in independent claim 22.

Accordingly, it is respectfully submitted that independent claims 1 and 22 are not anticipated by Itoh, and thus the rejection of independent claims 1 and 22 under 35 U.S.C. §102(b) over Itoh should be withdrawn. Dependent claims 2, 7, 9, 10 and 20, 21, 23 and 24 are allowable at least for the reasons set forth above with respect to independent claims 1 and 22, from which they respectively depend, as well as for their added features.

The Office Action rejects claims 22-26 under 35 U.S.C. §102(b) over U.S. Patent No. 4,453,757 to Soraoka (hereinafter “Soraoka”). The rejection is respectfully traversed.

Independent claim 22 is directed to a tray transferring apparatus for transferring a handling tray bearing electronic components. The specific features of independent claim 22 are as set forth above. Soraoka neither discloses nor suggests the features recited in independent claim 22, or the claimed combination of features.

Soraoka discloses a semiconductor wafer gripping device. The device includes a drum 7 rotatably mounted to a head 2, and a holder 13 fitted to an outer periphery of the drum 7. As

the drum 7 and holder 13 fitted thereto rotate, centrifugal force causes a plurality of claws 15 to extend outward from the holder 13. The claws 15 are positioned in a recess surrounding a semiconductor wafer 21, and as rotation of the drum 7 and holder 13 slows, the claws 15 are retracted so as to grip an outer edge of the semiconductor wafer 21.

The device disclosed by Soraoka is specifically designed to pick up a single semiconductor wafer 21. As would be well understood by one of ordinary skill in the art, such a semiconductor wafer would typically include a thin substrate with a number of circuit patterns etched therein. In contrast, the tray transferring apparatus recited in independent claim 22 transfers trays bearing electronic components, and in particular, a tray bearing a plurality of electronic components in holding depressions. It would be well understood by one of ordinary skill in the art that these types of trays may be of varying size/thickness to accommodate different types of devices, and thus the trays, and the transfer thereof, are significantly different from the semiconductor wafer that can be picked up by Soraoka's device.

Additionally, Soraoka's device uses a spinning motion to extend the claws 15 and pick up the wafer 21. One of ordinary skill in the art would not use any type of spinning motion to pick up a tray such as the tray recited in independent claim 22. In these types of trays, the electronic devices may be positioned in holding depressions, but the devices are not fixed within these holding depressions. Applying such a spinning motion to this type of tray would dislodge the devices from the depressions, thus exacerbating, rather than curing, the problems set forth with

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respect to related art devices in the present application (see page 2, lines 16-21, page 4, lines 12-20, and page 17, lines 12-19 of the present application).

Further, even if Soraoka's device were improperly compared to the tray transferring apparatus recited in independent claim 22, Soraoka still neither discloses nor suggests a fixing unit and a gripper unit as recited in independent claim 22. More specifically, the claws 15 (compared in the Office Action to the recited fixing unit) hold the wafer 21 beneath, but not immediately adjacent the head 2 (compared in the Office Action to the recited main frame) or the holder 13 coupled thereto. Thus, Soraoka neither discloses nor suggests a fixing unit that holds a first tray immediately adjacent a main frame, as recited in independent claim 22.

Likewise, as set forth above, Soraoka discloses only a single wafer 21 being picked up and held by the device. Soraoka neither discloses nor suggests that the claws 15 (compared in the Office Action to the recited gripper unit) hold a second wafer, or tray, let alone that such a second wafer would be held adjacent a side of a first wafer opposite the head 2 or holder, as does the gripper unit recited in independent claim 22. Rather, because the claws 15 must first be expanded in order to surround a second wafer prior to gripping, the first wafer 21 would be dropped, thus making it infeasible to pick up and hold multiple wafers with this single set of claws 15. Thus, Soraoka neither discloses nor suggests a gripper unit as recited in independent claim 22.

For all of the above reasons, it is respectfully submitted that independent claim 22 is not anticipated by Soraoka, and thus the rejection of independent claim 22 under 35 U.S.C. §102(b)

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over Soraoka should be withdrawn. Dependent claims 23-26 are allowable at least for the reasons set forth above with respect to independent claim 22, from which they depend, as well as for their added features.

III. Rejections Under 35 U.S.C. §103(a)

The Office Action rejects claims 11 under 35 U.S.C. §103(a) over Itoh. The rejection is respectfully traversed.

Dependent claim 11 is allowable at least for the reasons set forth above with respect to independent claim 1, from which it depends, as well as for its added features. Further, it is respectfully submitted that it would not have been obvious to modify the handler disclosed by Itoh in the manner suggested in the Office Action. Accordingly, it is respectfully submitted that claim 11 is allowable over Itoh, and thus the rejection of claim 11 under 35 U.S.C. §103(a) over Itoh should be withdrawn.

The Office Action rejects claims 3-6, 8, 12, 17-19, 25 and 26 under 35 U.S.C. §103(a) over Itoh in view of U.S. Patent No. 6,379,103 to Okugi (hereinafter “Okugi”). The rejection is respectfully traversed.

Dependent claims 3-6, 8, 12, 17-19, 25 and 26 are allowable over Itoh at least for the reasons set forth above with respect to independent claims 1 and 22, from which they respectively depend, as well as for their added features. Further, Okugi is merely cited as allegedly teaching the detailed structure of a fixing unit, and thus fails to overcome the deficiencies of Itoh. Accordingly, it is respectfully submitted that claims 3-6, 8, 12, 17-19, 25

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and 26 are allowable over the applied combination, and thus the rejection of claims 3-6, 8, 12, 17-19, 25 and 26 under 35 U.S.C. §103(a) over Itoh and Okugi should be withdrawn.

The Office Action rejects claims 13, 15 and 16 under 35 U.S.C. §103(a) over Itoh in view of U.S. Patent No. 6,354,792 to Kobayashi et al. (hereinafter “Kobayashi”). The rejection is respectfully traversed.

Dependent claims 13, 15 and 16 are allowable over Itoh at least for the reasons set forth above with respect to independent claim 1, from which they depend, as well as for their added features. Further, Kobayashi is merely cited as allegedly teaching an optical sensor, and thus fails to overcome the deficiencies of Itoh. Accordingly, it is respectfully submitted that claims 13, 15 and 16 are allowable over the applied combination, and thus the rejection of claims 13, 15 and 16 under 35 U.S.C. §103(a) over Itoh and Kobayashi should be withdrawn.

The Office Action rejects claims 1-7, 9, 10, 12, 13, 15, 16 20 and 21 under 35 U.S.C. §103(a) over Soraoka in view of Kobayashi. The rejection is respectfully traversed.

The features of independent claim 1 are as set forth above. As set forth above, Soraoka neither discloses nor suggests the features recited in independent claim 1, or the claimed combination of features. Further, as set forth above, Kobayashi is merely cited as allegedly teaching an optical sensor, and thus fails to overcome the deficiencies of Soraoka. Accordingly, it is respectfully submitted that independent claim 1 is allowable over the applied combination, and thus the rejection of independent claim 1 under 35 U.S.C. §103(a) over Soraoka and Kobayashi should be withdrawn. Dependent claims 2-7, 9, 10, 12, 13, 15, 16 20 and 21 are

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allowable at least for the reasons set forth above with respect to independent claim 1, from which they depend, as well as for their added features.

The Office Action rejects claims 8 and 17-19 under 35 U.S.C. §103(a) over Soraoka and Kobayashi in view of U.S. Patent No. 5,762,391 to Sumnitsch (hereinafter “Sumnitsch”). The rejection is respectfully traversed.

Dependent claims 8 and 17-19 are allowable over Soraoka and Kobayashi at least for the reasons set forth above with respect to independent claim 1, from which they depend, as well as for their added features. Further, Sumnitsch is merely cited as allegedly teaching the use of biased pins, and thus fails to overcome the deficiencies of Soraoka and Kobayashi. Accordingly, it is respectfully submitted that claims 8 and 17-19 are allowable, and thus the rejection of claims 8 and 17-19 under 35 U.S.C. §103(a) over Soraoka, Kobayashi and Sumnitsch should be withdrawn.

IV. Conclusion

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned, Joanna K. Mason, at the telephone number listed below.

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To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
KED & ASSOCIATES, LLP



John C. Eisenhart
Registration No. 38,128
Joanna K. Mason
Registration No. 56,408

P.O. Box 221200
Chantilly, Virginia 20153-1200
703 766-3777 JCE/JKM:lhd;jlg
Date: May 3, 2007
Q:\Documents\2021-622\117648.doc

Please direct all correspondence to Customer Number 34610